New species of Annulariidae (Gastropoda) from the Bahamas and Dominican Republic

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ABSTRACT. Ten new taxa of Annulariidae are described from the Bahamas and the Dominican Republic: *Abbottella* (*Abbottella*) *harpeza* n. sp.; *A.* (*A.*) *mellosa* n. sp.; *A.* (*A.*) *milleacantha* n. sp.; *Chondropoma* (*Chondropoma*) *marmoreum* n. sp.; *C.* (*Wetmorepoma*) *oculeum* n. sp.; *Chondropomium hooksi* n. sp.; *C. alyshae* n. sp.; *C. pumilum* n. sp.; *Chondropomella elegans* n. sp. from the Dominican Republic; and *Opisthosiphon* (*Opisthosiphona*) *simpsoni williamsae* n. subsp. from the Bahamas. *Chondropomella* is removed from the Chondropominae to the Tudorinae.

INTRODUCTION

The family Annulariidae is one of the largest land snail families in the world despite its relatively narrow distribution in the Caribbean region. Many species have very narrow ranges. Hispaniola, and to a lesser extent the Bahamas, are areas of particularly high diversity of these snails. The annulariids of these islands were covered in detail by Bartsch (1946) and it seemed that there was little left to be done. Nevertheless, recent collections there reveal no apparent end to the diversity of these snails – ten new taxa are described here, most from a fairly narrow region of the Barahona Peninsula, an area known to harbor numerous endemics and peculiar taxa.

Repositories

BMNH: The Natural History Museum, London, UK.
GTW: Collection of G. Thomas Watters, Columbus, Ohio, USA.
OSUM: The Ohio State University Museum of Biological Diversity, Columbus, Ohio, USA.
UF: Florida Museum of Natural History, Gainesville, Florida, USA.

SYSTEMATICS

Superfamily **LITTORINOIDEA**
Family **ANNULARIIDAE** Henderson & Bartsch, 1920
Subfamily **ANNULARIINAE** Henderson & Bartsch, 1920
Genus ***Abbottella*** Henderson & Bartsch, 1920
Type species *Chondropomum moreletianum* Crosse, 1873 (by original designation) – Recent, Hispaniola, Cuba.

Abbottella (*Abbottella*) *harpeza* n. sp.

Figs 1-3

Type material. Holotype UF 420731 (5.6 mm maximum length, including peristome x 7.1 mm maximum width, including peristome).

Type locality. Dominican Republic, Isla Beata.

Distribution. Known only from the type locality.

Material Examined. UF 420731, Dominican Republic, Isla Beata, under leaf mold (holotype), May, 1993, G. Duffy!

Description. Shell small (holotype 5.6 mm maximum length, including peristome x 7.1 mm maximum width, including peristome), helicoid, umbilicus wide (holotype 26% of maximum width), circular, and open to apex. Nuclear whorls 1 ¼, scarcely demarcated from the teleoconch, smooth, prominent. Teleoconch of 2 ¾ whorls, adnate except for immediately behind the peristome. Suture deeply impressed. Peristome double (holotype 2.1 mm diameter maximum inner aperture height x 2.0 mm diameter maximum inner aperture width; holotype 3.6 mm diameter maximum outer peristome height x 3.5 mm diameter maximum outer peristome width, but broken). Outer lip fairly thick, widely expanded, fluted, perpendicular to the whorl except posteriorly where it forms a wide concave auricle adherent to the previous whorl, ventrally covered with numerous erect, concentric lamellae. Inner lip exserted, very short. Spiral sculpture of low, squarish threads (~26 on the final whorl), every fifth one or so stronger than intervening threads, becoming stronger and more widely separated towards the umbilicus. Axial sculpture of closely spaced, fine lamellae between which are numerous

microscopic lamellae. Intersections of spiral and axial sculptures produced into sharp, erect denticles, except in the umbilicus. Suture bounded by numerous denticles. Background color tan with darker spiral bands on top of whorls, breaking up into linear spots on the base and umbilicus. Both sides of outer lip with bold, radiating brown bands. Operculum multispiral with obliquely projecting lamella.

Discussion. *Abbottella harpeza* most closely resembles *A. crossei* (Pilsbry, 1933). Pilsbry gave only "Santo Domingo" as the type locality for *A. crossei*, referring to the island rather than the city. Bartsch (1946) identified Pilsbry's species with specimens from Samaná Bay in the northeastern Dominican Republic. *Abbottella harpeza* is more darkly colored than *A. crossei* and the thorny sculpture is more pronounced; the denticles are more aligned with the spiral sculpture than the axial sculpture in *A. harpeza*, the opposite is true of *A. crossei*. Species of *Abbottella*, including *A. crossei*, occur along the northern coast of Hispaniola and easternmost Cuba, although a few species have not been localized since their descriptions. This species from Isla Beata and *A. milleacantha* n. sp. from Isla Saona are the only species known from the southern coast of Hispaniola. Although known from a single specimen, this species is sufficiently distinct and geographically isolated to warrant description.

Etymology. Greek *harpeza*, a thorny hedge, in reference to the prickly sculpture of the shell.

Abbottella* (*Abbottella*) *mellosa n. sp.
Figs 4-6

Type material. Holotype UF 420729 (6.9 mm maximum length, including peristome x 7.9 mm maximum width, including peristome). Paratype OSUM 32477, from type locality (5.6 mm maximum length, including peristome x 6.6 mm maximum width, including peristome).

Type locality. Dominican Republic, Los Brazos, near Sosúa.

Distribution. Known only from the type locality.

Material Examined. Dominican Republic, Los Brazos, near Sosúa, on limestone after rain, April, 2004, A. Bodart & M. Coltro! (holotype, paratype, GTW 14055a [4 dd])

Description. Shell small (holotype 6.9 mm maximum length, including peristome x 7.9 mm maximum width, including peristome), helicoid, umbilicus wide (holotype 26% of maximum width), elliptical, and open to apex. Nuclear whorls 1 ¼, scarcely demarcated from the teleoconch, smooth, prominent. Teleoconch of 3 ½ whorls, adnate except for immediately behind the peristome. Suture impressed. Peristome double (holotype 2.6 mm diameter maximum inner aperture height x 2.7 mm diameter maximum inner aperture width; holotype 3.9 mm diameter maximum outer peristome height x 3.7 mm diameter maximum outer peristome width). Outer lip fairly thick, fluted, perpendicular to the whorl at its base, concave at the apex, widely expanded, barely adnate to the previous whorl. Inner lip exserted, very short. Spiral sculpture of feeble threads (~30 on the final whorl), widely separated, becoming stronger towards the umbilicus. Axial sculpture of numerous feeble threads between which are microscopic lamellae. Spiral and axial sculptures intersect forming square pits, the junctures produced into very weak nodules. At the suture the axial sculpture forms minute cusps. On the holotype every fifth axial or so forms a peculiar enlarged scale at the suture; this is variable on other specimens examined. Shell honey-colored, waxy in appearance, with pale tan spots arranged in a barely discernable spiral pattern. Both sides of outer lip with radiating brown bands. Operculum multispiral with obliquely projecting lamella.

Discussion. *Abbottella mellosa* is characterized by its subdued sculpture and waxy appearance; it is probably the least sculptured of all the *Abbottella*. Only *A. adolfi* (Pfeiffer, 1852) approaches it in this regard. *Abbottella adolfi* has not been localized although Bartsch (1946) described the subspecies *peninsularis* from the Samaná Peninsula. *Abbottella mellosa* differs in having even finer, almost obsolete sculpture, the peculiar sutural tufts, and a lighter color.

Etymology. Latin *mellosa*, honey-colored, in reference to the color of the shell.

Abbottella* (*Abbottella*) *milleacantha n. sp.
Figs 7-9

Type material. Holotype UF 420728 (5.7 mm maximum length, including peristome x 7.5 mm width, including peristome). Paratype OSUM 32478, from type locality (5.5 mm maximum length, including peristome x 7.8 mm width, including peristome).

Type locality. Dominican Republic, northeast Isla Saona.

Distribution. Known only from the type locality.

Material examined. Dominican Republic, northeast Isla Saona, on limestone rocks, May, 1997, G. Duffy! (holotype & paratype).

Description. Shell small (holotype 5.7 mm maximum length, including peristome x 7.5 mm width, including peristome), helicoid, umbilicus wide (holotype 27% of

maximum width), circular, and open to apex. Nuclear whorls 1 ¼, scarcely demarcated from the teleoconch, smooth, prominent. Teleoconch of 2 ¾ whorls, adnate except for immediately behind the peristome. Suture impressed. Peristome double (holotype 2.8 mm diameter maximum inner aperture height x 2.5 mm diameter maximum inner aperture width; holotype 3.9 mm diameter maximum outer peristome height x 3.3 mm diameter maximum outer peristome width). Outer lip thin, fluted, perpendicular to the whorl, narrow except where the posterior edge is produced into a triangular auricle adherent with the previous whorl. Inner lip exserted, very short. Spiral sculpture of numerous (~30 on the final whorl) low threads, becoming stronger and more widely separated towards the umbilicus. Axial sculpture of closely spaced, minute, thin, low lamellae between which are numerous microscopic lamellae. Intersections of spiral and axial sculptures form erect prickles, strongest on periphery. Shell straw-colored with occasional obscure, pale tan spots. Early whorls may have a brown peripheral band. Operculum multispiral with obliquely projecting lamella.

Discussion. The uniformly minute, prickly sculpture and pale coloration is characteristic of this species. It is most closely related to the *Abbottella moreletiana* (Crosse, 1873) group of subspecies centered around Samaná Bay, particularly *A. m. gabriella* Bartsch, 1946. It differs in having even finer sculpture, a smaller umbilicus, and in its geographic isolation. It is the only *Abbottella* known from Isla Saona and only the second species known from southern Hispaniola.

Etymology. Latin *mille*, thousand + Greek *akantha*, thorn, prickle, in reference to the sculpture of the shell.

Subfamily **CHONDROPOMATINAE** Henderson & Bartsch, 1920
Genus ***Opisthosiphon*** Dall, 1905
Subgenus ***Opisthosiphona*** Henderson & Bartsch, 1920
Type species *Cyclostoma moreletianum* Petit de la Saussaye, 1850 (by original designation) – Recent, Cuba and Bahamas

Opisthosiphon (Opisthosiphona) simpsoni williamsae n. subsp.
Figs 10-12

Type material. Holotype UF 420736 (10.5 mm maximum length, including peristome, decollate x 5.5 mm maximum width, including peristome). Paratype OSUM 32480, Andros Island, 1.3 km E of Andros airport (11.6 mm maximum length, including peristome, decollate x 6.2 mm maximum width, including peristome). Paratype OSUM 32481, Andros Island, Red Bay settlement, 19.2 km W of Nicolls Town (9.7 mm maximum length, including peristome, decollate x 5.2 mm maximum width, including peristome). Paratype OSUM 32479, Berry Islands, Chub Cay, east end of airport runway, under rubble (11.5 mm maximum length, including peristome, decollate x 6.0 mm maximum width, including peristome).

Type locality. Bahamas, Andros Island, Twin Lakes Farm along Fresh Creek.

Material Examined. Bahamas. OSUM 6214. Andros Island, 1.3 km E of Andros airport. 24 June, 1974. C.B. Stein et al.! 16 dd (paratype lot) – OSUM 6344, 6355. Andros Island, Twin Lakes Farm along Fresh Creek. 24, 27 June, 1974. C.B. Stein et al.! 117 dd (holotype lot) – OSUM 6360. Andros Island, Red Bay settlement, 19.2 km W of Nicolls Town. 28 June, 1974. C.B. Stein et al.! 28 dd (paratype lot) – OSUM 6327. Andros Island, around blue hole, 23 km S of Stafford Creek settlement. 23 June, 1974. C.B. Stein et al.! 38 dd. – OSUM 6369. Andros Island, under rocks, ~67 m from shore, W of Red Bay settlement. 28 June, 1974. C.B. Stein et al.! 1 dd. – OSUM 6459. Andros Island, pine forest along road ~6 km NW of Staniard Creek settlement. 26 June, 1974. C.B. Stein et al.! 55 dd. – OSUM 6133. Andros Island, at airport. 20 June, 1974. C.B. Stein et al.! 1 dd. – GTW 13700a. Berry Islands, Chub Cay, east end of airport runway, under rubble. 18 May, 2007. G.T. Watters! 6 dd (paratype lot).

Distribution. Known from the northern half of Andros Island and Chub Cay, Berry Islands.

Description. Shell small (holotype 10.5 mm maximum length, including peristome, decollate x 5.5 mm maximum width, including peristome), pupoid, decollate as adult, umbilicus narrow but open. Nuclear whorls 1 ¼, scarcely demarcated from the teleoconch, smooth, tan with brown periphery, usually lost when adult. Non-decollate teleoconch of 4 whorls, adnate except for immediately behind the peristome. Suture channeled. Peristome double (holotype 2.7 mm diameter maximum inner aperture height x 2.3 mm diameter maximum inner aperture width; holotype 4.1 mm diameter maximum outer peristome height x 3.6 mm diameter maximum outer peristome width). Outer lip thin, perpendicular to the whorl, narrow to moderately expanded (wider over the umbilicus), composed of numerous layers. Inner lip exserted, very short. Siphon short, recurved dorsally and towards the previous whorl, its opening facing inward. Spiral sculpture absent except for weak ribs within the umbilicus. Axial sculpture of numerous, closely spaced, low lamellae. At the suture every other lamella is expanded into a prominent denticle that partially obscures the suture. Background color orange-red to gray or pale brown with 7-10 narrow spiral rows of smudged brown spots, the spots visible through the shell in the aperture. Operculum

"rhytidopomine" - with a paucispiral chondroid base supporting a smaller calcareous plate composed of short erect lamellae curving from the distal to proximal border of the opercular whorl, without a sulcus.
The density of the axial lamellae and the width of the outer lip varies among specimens, as does the strength of the cusps. The color pattern is nearly always well-developed and varies from broken spiral bands and spots to (rarely) solid bands. In some specimens the earlier whorls are dark brown or purplish.

Discussion. Bartsch (1946) named four subspecies of *O. simpsoni*: *simpsoni s.s.* from Riding Point, Grand Bahama Island; *bryanti* from Lubbers Quarters off eastern Great Abaco Island; *abacoensis* from Matthew Point, Great Abaco Island; and *saccharinus* from Sugar Loaf Cay off northern Great Abaco Island. These taxa were based on combinations of axial rib numbers, intensity of color patterns, and width of outer lip. However, additional examples from elsewhere on Great Abaco Island complicate Bartsch's simple scheme. Specimens vary in sculptural strength, lip width, and color intensity without any discernable zoogeographic pattern.
This is also apparent in the Andros Island subspecies described here where local populations have various combinations of Bartsch's shell characters. For instance, the airport populations have wider lips than do others, the Twin Lake population has the most pronounced cusps, the blue hole population has the most widely spaced axial ribs, etc. While each of these could be considered a separate subspecies by Bartsch's criteria, we believe these to be nothing more than local variants exhibiting no greater overall geographic pattern.
Although features such as the width of the lip and axial rib spacing vary, overall *Opisthosiphon simpsoni williamsae* differs from *Opisthosiphon simpsoni s.s.* in having consistently more pronounced cusps and in having a clearly defined color pattern in all populations. *Opisthosiphon simpsoni williamsae* is the first *Opisthosiphon* recorded from the Berry Islands, which are located just off of northern Andros Island where this subspecies is also found. It is unusual that Bartsch did not have any specimens of this subspecies, particularly as he had specimens of *Opisthosiphon androsensis* Pilsbry, 1930, from Stafford Lake within the range of this subspecies.

Etymology. Named for Margaret "Peggy" Williams of Tallevast, Florida, USA, in recognition of her years of assisting both professional and amateur malacologists alike.

Genus ***Chondropoma*** Pfeiffer, 1847
Type species *Cyclostoma sagra* d'Orbigny, 1842 (by subsequent designation of Petit de la Saussaye, 1850) – Recent, Puerto Rico, Cuba, Hispaniola, Bahamas, Virgin Islands, Turks and Caicos, Cayman Islands, Swan Island, Guadeloupe.

Subgenus ***Wetmorepoma*** Bartsch, 1946
Type species *Chondropoma wetmorei* Bartsch, 1932 (by original designation) – Recent, Hispaniola.

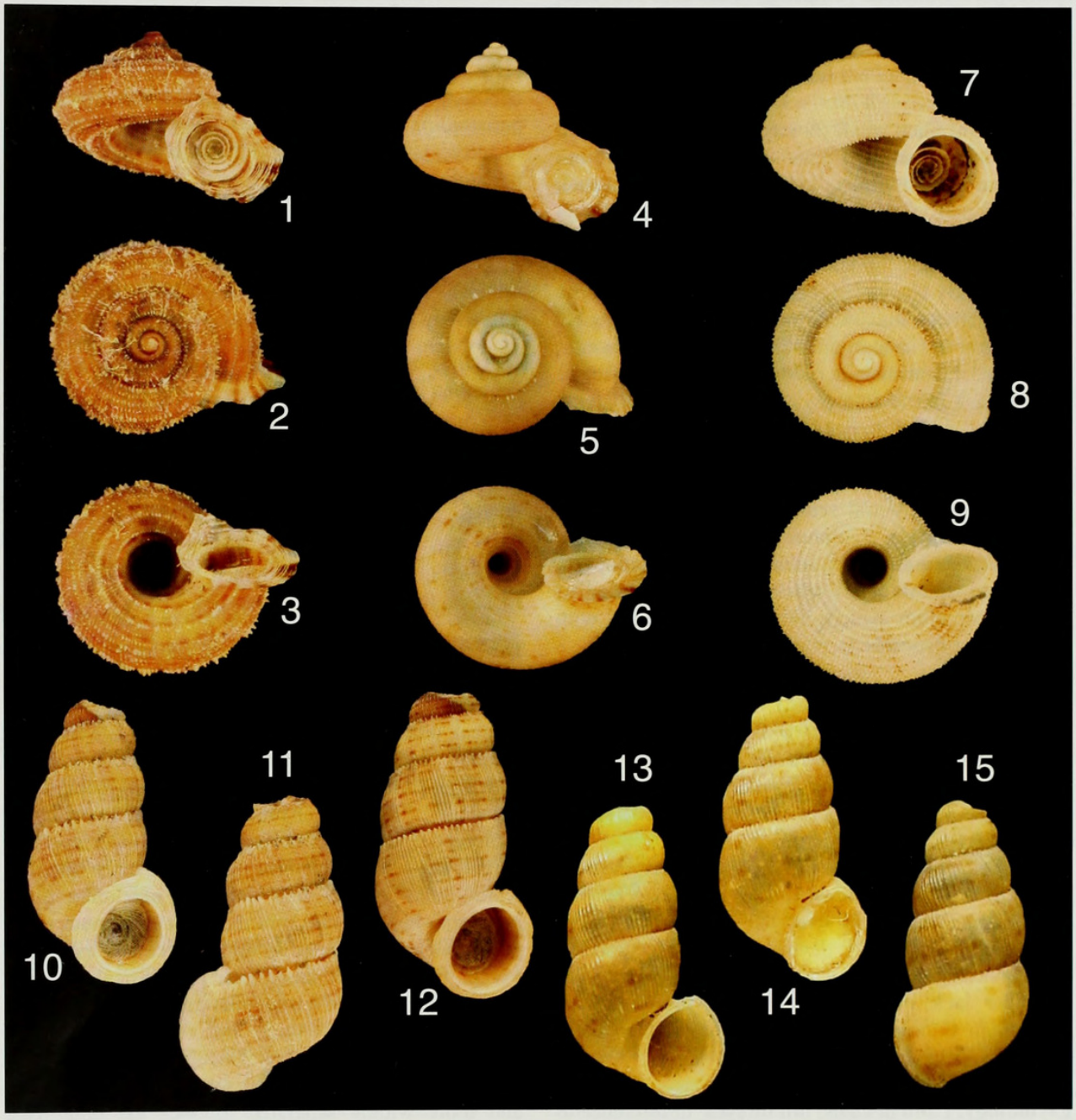
Chondropoma* (*Wetmorepoma*) *oculeum n. sp.
Figs 13-15

Type material. Holotype UF 420737 (9.0 mm maximum length, including peristome, decollate x 4.6 mm maximum width, including peristome). Paratype OSUM 32488, Barahona Peninsula, Pedernales Province, 16 km from intersection of main highway and road from Cabo Rojo, dry area, under rocks (9.2 mm maximum length, including peristome, decollate x 4.8 mm maximum width, including peristome). Paratype BMNH 1996348, Barahona Peninsula, Pedernales Province, SW part of Sierra de Baoruco, 23 km N of Cabo Rojo (9.0 mm maximum length, including peristome, decollate x 4.7 mm maximum width, including peristome).

Type locality. Dominican Republic, Barahona Peninsula, Pedernales Province, 14.5 km N of Cabo Rojo, 500 m, under rocks in red dirt.

Figures 1-15

1-3. *Abbottella harpeza* n. sp., Holotype UF 420731, Dominican Republic, Isla Beata, 5.6 mm length;
4-6. *A. mellosa* n. sp., Holotype UF 420729, Dominican Republic, Los Brazos, near Sosúa, 6.9 mm length;
7-9. *A. milleacantha* n. sp., Holotype UF 420728, Dominican Republic, NE Isla Saona, 5.7 mm length;
10-12. *Opisthosiphon simpsoni williamsae* n. subsp. **10-11.** Holotype UF 420736, Bahamas, Andros Island, Twin Lakes Farm along Fresh Creek, 10.5 mm length; **12.** Paratype OSUM 32479, Berry Islands, Chub Cay, E end of airport runway, 11.3 mm length.
13-15. *Chondropoma oculeum* n. sp. **13.** Paratype OSUM 32488, Barahona Peninsula, Pedernales Province, 16 km from intersection of main highway and road from Cabo Rojo, 9.2 mm length; **14-15.** Holotype UF 420737, Dominican Republic, Barahona Peninsula, Pedernales Province, 14.5 km N of Cabo Rojo, 9.0 mm length.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Distribution. Dominican Republic, southern Barahona Peninsula.

Material examined. Dominican Republic. Barahona Peninsula, Pedernales Province, 14.5 km N of Cabo Rojo, at 500 m, 28 Sept., 1996, G. Duffy! (holotype) - Barahona Peninsula, Pedernales Province, 16 km from intersection of main highway and road from Cabo Rojo, dry area, under rocks, 28 Sept., 1996, G. Duffy! (paratype) – Barahona Peninsula, Pedernales Province, SW part of Sierra de Baoruco, 23 km N of Cabo Rojo, ~300 m above sea level, 28 Sept., 1996, G.Duffy! (paratype).

Description. Shell small (holotype 9.0 mm maximum length, including peristome, decollate x 4.6 mm maximum width, including peristome), elongate, umbilicus narrow but open, decollate as adult, shining. Nuclear whorls unknown. Teleoconch of ~4 ¼ whorls, adnate except for immediately behind the peristome. Suture weakly channeled. Peristome double (holotype 2.7 mm diameter maximum inner aperture height x 1.9 mm diameter maximum inner aperture width; holotype 3.1 mm diameter maximum outer peristome height x 2.3 mm diameter maximum outer peristome width). Outer lip thin, not expanded except for a weak triangular auricle posteriorly, separate from the previous whorl. Inner lip very short, exserted. Spiral sculpture absent. Axial sculpture of low but distinct raised cords. Axial sculpture produced into minute cusps at suture. Background golden with tan, interrupted spiral bands often forming a series of spots. Operculum paucispiral chondroid plate with fine granular deposit.

Discussion. Bartsch (1946) considered this a monotypic genus endemic to Isla Beata. This new species expands the range to the southern tip of the Barahona Peninsula on the mainland adjacent to Isla Beata. This is *Chondropoma* (*Wetmorepoma*) sp. of Watters (2006: 29).
This species differs from *C.* (*W.*) *wetmorei* Bartsch, 1932, the only other known species of *Wetmorepoma*, in having axial threads over the entire shell (in *C. wetmorei* the spire is devoid of axial sculpture), accompanying sutural cusps (absent in *C. wetmorei*), complete lack of spiral threads in the umbilicus (present in *C. wetmorei*), and a more subdued color pattern.

Etymology. Latin *oculeus*, full of eyes, in reference to the pattern of spots on the shell.

Subgenus ***Chondropoma*** Pfeiffer, 1847
Type species *Cyclostoma sagra* d'Orbigny, 1842 (by subsequent designation of Petit de la Saussaye, 1850) – Recent, Puerto Rico, Cuba, Hispaniola, Bahamas, Virgin Islands, Turks and Caicos, Cayman Islands, Swan Island, Guadeloupe.

Chondropoma* (*Chondropoma*) *marmoreum n. sp.
Figs 16-19

Type material. Holotype UF 420735 (18.3 mm maximum length, including peristome, decollate x 10.9 mm maximum width, including peristome). Paratype OSUM 32483, Barahona Peninsula, Pedernales Province, 22.4 km W of Oviedo (15.4 mm maximum length, including peristome, decollate x 9.2 mm maximum width, including peristome). Paratype OSUM 32482, Barahona Peninsula, Pedernales Province, Cabo Falso, under rocks on limestone cliff (17.8 mm maximum length, including peristome, decollate x 10.9 mm maximum width, including peristome). Paratype BMNH 1996347, from type locality (18.3 mm maximum length, including peristome, decollate x 9.6 mm maximum width, including peristome).

Type locality. Dominican Republic, Barahona Peninsula, Pedernales Province, along Route 44 ca. 10 km SE of Pedernales.

Distribution. Dominican Republic, southern Barahona Peninsula.

Material examined. Dominican Republic. Barahona Peninsula, Pedernales Province, 35 km W of Oviedo, ~ 61 m above sea level, 26 Sept., 1996. G. Duffy! (holotype) - Barahona Peninsula, Pedernales Province, 22.4 km W of Oviedo (paratype) - Barahona Peninsula, Pedernales Province, Cabo Falso, under rocks on limestone cliff (paratype).

Description. Shell medium sized (holotype 18.3 mm maximum length, including peristome, decollate x 10.9 mm maximum width, including peristome), conical, umbilicus narrow but open, decollate as adult, shining. Nuclear whorls unknown. Teleoconch of ~4 ¼ whorls, adnate except for immediately behind the peristome. Suture channeled. Peristome double (holotype 5.3 mm diameter maximum inner aperture height x 4.6 mm diameter maximum inner aperture width; holotype 6.9 mm diameter maximum outer peristome height x 5.8 mm diameter maximum outer peristome width). Outer lip thin, moderately expanded except narrowed at umbilicus, perpendicular to the whorl, produced into a triangular auricle separate from the previous whorl. Inner lip very short, largely adherent to outer lip. Spiral sculpture of numerous (~36 on final whorl) low threads, becoming stronger and more widely separated towards the umbilicus. Axial sculpture of similar threads. Intersections of spiral and axial sculptures form latticed pattern of weak beads. Axial threads scarcely produced into cusps at suture. Shell tan to grey with dark brown "D"-shaped spots arranged in spiral bands, often aligned into vague axial stripes. Outer lip white. Operculum paucispiral chondroid plate with fine granular deposit.

Discussion. In overall form and color pattern this species resembles *Chondropoma eyerdami* Bartsch, 1946, from the Tiburon Peninsula of Haiti and *Chondropoma brownianum* Weinland, 1880, from Isla Gonave, Haiti. Both species have stronger sculpture than *C. marmoreum.* In addition, *Chondropoma brownianum* lacks the double, reflected lip of *C. marmoreum.*

Etymology. Latin *marmoreus*, marbled, in reference to the color pattern.

Subfamily **TUDORINAE** Watters, 2006
Genus ***Chondropomium*** Henderson & Bartsch, 1920
Type species *Chondropoma weinlandi* Pfeiffer, 1862 (by original designation) – Recent, Hispaniola.

Chondropomium hooksi n. sp.
Figs 20-23

Type material. Holotype UF 420727 (19.2 mm maximum length, including peristome, decollate x 10.9 mm maximum width, including peristome). Paratype OSUM 32486, Peravia Province, 21 km W of Bani, ~60-90 m above sea level (18.7 mm maximum length, including peristome, decollate x 10.5 mm maximum width, including peristome). Paratype BMNH 1996351, Peravia Province, 21 km W of Bani, ~60-90 m above sea level (19.1 mm maximum length, including peristome, decollate x 11.1 mm maximum width, including peristome).

Type locality. Dominican Republic, Peravia Province, Punta Salina, 21 km W of Bani, under rocks on hill.

Distribution. Dominican Republic, southern Peravia Province.

Material examined. Dominican Republic. Peravia Province, 21 km W of Bani, ~60-90 m above sea level, 23 Sept., 1996, G. Duffy! (paratypes) – Peravia Province, Punta Salina, 22 km W of Bani, under rocks on hill, 23 Sept., 1996, G. Duffy! (holotype).

Description. Shell medium sized (holotype 19.2 maximum length, including peristome, decollate x 10.9 mm maximum width, including peristome), inflated, umbilicus narrow but open, decollate as adult. Nuclear whorls unknown. Teleoconch of ~4 ¾ whorls, adnate except for immediately behind the peristome. Suture indented. Peristome double (holotype 2.1 mm diameter maximum inner aperture height x 2.0 mm diameter maximum inner aperture width; holotype 5.9 mm diameter maximum outer peristome height x 5.3 mm diameter maximum outer peristome width). Outer lip moderately expanded, narrowest over umbilicus, produced into a small triangular auricle posteriorly, separate from the previous whorl. Inner lip flush with outer lip near umbilicus, very short and exserted elsewhere. Spiral sculpture of numerous (~36 on final whorl) low threads. Axial sculpture of similar threads forming a microscopic latticed pattern. Intersections of sculpture scarcely enlarged into weak beads. Groups of 3-10 axial threads gathered at suture into fused tufts. Background pale tan with rows of brown spots, often smudged or in groups, arranged in spiral patterns. Spiral pattern continues onto ventral face of outer lip. Tufts may be white. Operculum paucispiral chondroid plate on which are calcareous lamella flattened and fused into a concave plate, lacking a sulcus.

Discussion. This species and the next, *C. alyshae*, are placed in *Chondropomium* with reservations. They are the only species known from the genus with spiral sculpture outside of the umbilicus, but in overall form they resemble other *Chondropomium*, such as *C. swifti* (Shuttleworth, 1854), *C. beatense* (Clench, 1932), and *C. ignotum* (Bartsch, 1946). It may be that *C. hooksi* and *C. alyshae* form a separate unnamed genus allied with *Chondropomium.*
Chondropomium hooksi differs from *C. alyshae* primarily in sculpture. In *C. hooksi* the sculpture is finely beaded, whereas in *C. alyshae* it is serrated. The axial sculpture forms individual cusps at the suture in *C. alyshae* but form fused tufts of 3-10 axials in *C. hooksi*. From *Chondropoma marmoratum*, n. sp., *C. hooksi* has much finer sculpture and a pseudolamellate operculum.

Etymology. Randy Hooks, friend of GD who helped collect many of the specimens in this paper.

Chondropomium alyshae n. sp.
Figs 24-26

Type material. Holotype UF 420733 (18.7 mm maximum length, including peristome, decollate x 10.6 mm maximum width, including peristome). Paratype OSUM 32487, from type locality (17.4 mm maximum length, including peristome, decollate x 10.0 mm maximum width, including peristome). Paratype BMNH 1996352, from type locality (20.1 mm maximum length, including peristome, decollate x 10.5 mm maximum width, including peristome).

Type locality. Dominican Republic, Barahona Province, 12 km S off main highway to Puerto Alejandro.

Distribution. Known only from the type locality.

Material examined. Dominican Republic. Barahona Province, 12 km S off main highway to Puerto Alejandro, 25 September 1996, G. Duffy! (holotype & paratypes).

Description. Shell medium sized (holotype 18.7 mm maximum length, including peristome, decollate x 10.6 mm maximum width, including peristome),

inflated, umbilicus narrow but open, decollate as adult. Nuclear whorls unknown. Teleoconch of 3 ¾ - 4 whorls, adnate except for immediately behind the peristome. Suture indented. Peristome double (holotype 5.8 mm diameter maximum inner aperture height x 4.7 mm diameter maximum inner aperture width; holotype 8.1 mm diameter maximum outer peristome height x 6.2 mm diameter maximum outer peristome width). Outer lip moderately expanded, scalloped, narrowest over umbilicus, produced into a broad, curved auricle posteriorly, separate from the previous whorl. Inner lip very short and exserted. Spiral sculpture of numerous (~30 in the final whorl) low, narrow, flat, widely-separated threads. Axial sculpture of very fine threads. Intersections of sculpture produced into miscroscopic scales forming a fine serrated surface. Axial threads elongated at suture into unfused blade-like cusps. Background grayish, axial threads and cusps white, with spiral rows of tan chevron-shaped spots. Operculum paucispiral chondroid plate on which are calcareous lamellae flattened and fused into a concave plate, lacking a sulcus.

Discussion. See under *Chondropomium hooksi*, n. sp.

Etymology. Alysha Duffy, daughter of GD.

Chondropomium pumilum n. sp.
Figs 27-30

Type material. Holotype UF 420734 (15.0 mm maximum length, including peristome, decollate x 10.3 mm maximum width, including peristome). Paratype OSUM 32484, Barahona Province, Pedernales Province, 19-32 km N of Cabo Rojo, ~790-900 m above sea level in the Sierra de Bohoruco (15.9 mm maximum length, including peristome, decollate x 10.7 mm maximum width, including peristome). Paratype BMNH 1996350, Barahona Province, Pedernales Province, 19-32 km N of Cabo Rojo, ~790-900 m above sea level in the Sierra de Bohoruco (16.3 mm maximum length, including peristome, decollate x 10.3 mm maximum width, including peristome).

Type locality. Dominican Republic, Barahona Province, Pedernales Province, 19-32 km N of Cabo Rojo, under rocks at ~500 m.

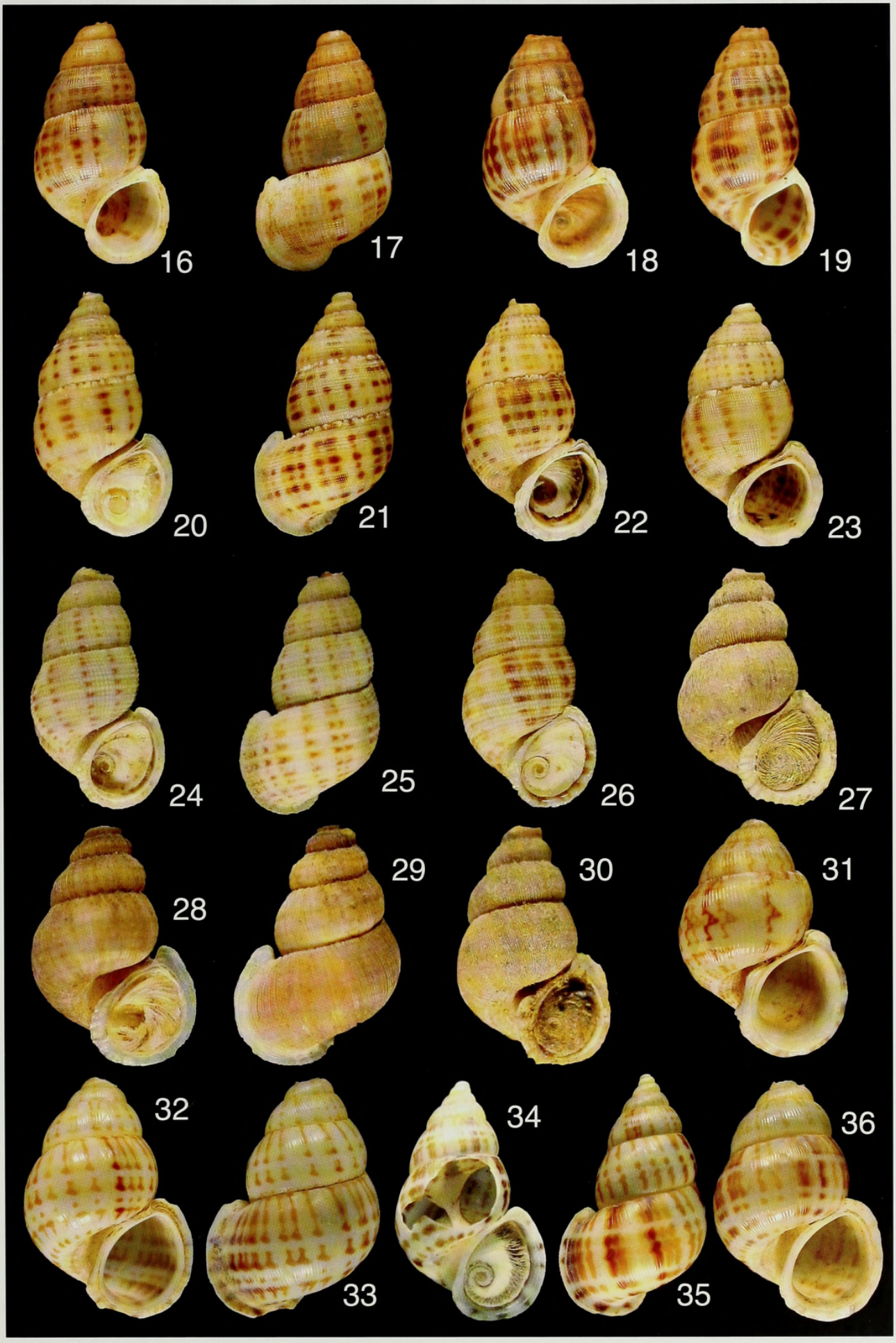
Distribution. Dominican Republic, Barahona Province, Pedernales Province, ~10-30 km N of Cabo Rojo, under rocks at ~500-900 m.

Material examined. Dominican Republic. Barahona Province, Pedernales Province, 19-32 km N of Cabo Rojo, ~790-900 m above sea level in the Sierra de Bohoruco, 28 Sept., 1996, G. Duffy! (paratypes) – Barahona Province, 19-32 km N of Cabo Rojo, under rocks at ~500 m, 28 Sept., 1996, G. Duffy! (holotype).

Description. Shell medium sized (holotype 15.0 mm maximum length, including peristome, decollate x 10.3 mm maximum width, including peristome), conical, umbilicus wide, open, decollate as adult. Nuclear whorls unknown. Teleoconch of 4 ¼ - 4 ½ whorls, adnate except for immediately behind the peristome. Suture channeled. Peristome double

Figures 16-36

16-19. *Chondropoma marmoreum* n. sp. **16-17.** Holotype UF 420735, Dominican Republic, Barahona Peninsula, Pedernales Province, 35 km W of Oviedo, 18.3 mm length; **18.** Paratype OSUM 32483, Barahona Peninsula, Pedernales Province, 14 mi. W of Oviedo, 15.4 mm length; **19.** Paratype BMNH 1996347, from type locality, 18.3 mm length.
20-23. *C. hooksi* n. sp. **20-21.** Holotype UF 420727, Dominican Republic, Peravia Province, Punta Salina, 13 mi. W of Bani, 19.2 mm length; **22.** Paratype OSUM 32486, Peravia Province, 21 km W of Bani, 18.7 mm length; **23.** Paratype BMNH 1996351, Peravia Province, 21 km W of Bani, 19.1 mm length.
24-26. *C. alyshae* n. sp. **24-25.** Holotype UF 420733, Dominican Republic, Barahona Province, 12 km S off main highway to Puerto Alejandro, 18.7 mm length; **26.** Paratype OSUM 32487, from type locality, 17.4 mm length.
27-30. *C. pumilum* n. sp. **27.** Paratype OSUM 32484, Barahona Province, Pedernales Province, 19-32 km N of Cabo Rojo, ~790-900 m above sea level in the Sierra de Bohoruco, 15.9 mm length; **28-29.** Holotype UF 420734, Dominican Republic, Barahona Province, Pedernales Province, 19-32 km N of Cabo Rojo, under rocks at ~500 m, 15.0 mm length; **30.** Paratype BMNH 1996350, Barahona Province, Pedernales Province, 19-32 km N of Cabo Rojo, ~790-900 m above sea level in the Sierra de Bohoruco, 16.3 mm length.
31. *Chondropomella magnifica* (Pfeiffer, 1852). GTW 7639a, Dominican Republic, Barrera, 267 m, 26.5 mm length.
32-36. *C. elegans* n. sp. **32-33.** Holotype UF 420732, Dominican Republic, Independencia Province, ~ 8 km SW of Duvergé, Puerto Escondita, ~457 m above sea level, 27.2 mm length; **34-35.** Paratype OSUM 32485, from type locality, 30.3 mm length; **36.** Paratype BMNH 1996349, from type locality, 24.5 mm length.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(holotype 5.4 mm diameter maximum inner aperture height x 4.7 mm diameter maximum inner aperture width; holotype 7.4 mm diameter maximum outer peristome height x 6.4 mm diameter maximum outer peristome width). Outer lip widely expanded, strongly scalloped on anterior margin, narrowest over umbilicus, produced into a prominent, concave auricle posteriorly, separate from the previous whorl. Inner lip very short and exserted. Spiral sculpture absent except for a few low, undulating cords in the umbilicus. Axial sculpture of numerous closely spaced, thin, low lamellae, occasionally anastomosing. Axial lamellae slightly elongated at suture into blade-like cusps. Background tan or brownish purple with vague narrow, spiral brown bands. Outer lip white. Operculum paucispiral chondroid plate on which are coarse calcareous lamellae fused into a concave plate, lacking a sulcus; operculum barely fitting in aperture.

Discussion. This species resembles a miniature *Chondropomium nobile* (Pfeiffer, 1852) in every respect. *Chondropomium nobile* exceeds 27 mm in length, but *C. pumilum* attains only ~15 mm. *Chondropomium nobile* inhabits the eastern edge of the Barahona Peninsula whereas *C. pumilum* inhabits the western edge.

Etymology. Latin *pumilum*, dwarfish, in reference to its relationship to *Chondropomium nobile.*

Genus : *Chondropomella* Bartsch, 1932
Type species : *Cyclostoma magnificum* "Sallé" Pfeiffer, 1852 (by original designation) – Hispaniola

Chondropomella elegans n. sp.
Figs 32-36

Type material. Holotype UF 420732 (27.2 mm maximum length, including peristome, decollate x 19.0 mm maximum width, including peristome). Paratype OSUM 32485, from type locality (30.3 mm maximum length, including peristome x 17.9 mm maximum width, including peristome). Paratype BMNH 1996349, from type locality (24.5 mm maximum length, including peristome, decollate x 17.4 mm maximum width, including peristome).

Type locality. Dominican Republic, Independencia Province, ~ 8 km SW of Duvergé, Puerto Escondita, ~457 m above sea level.

Distribution. Known only from the type locality.

Material examined. Dominican Republic, Independencia Province, ~ 8 km SW of Duvergé, Puerto Escondita, ~457 m above sea level, 26 Sept., 1996, G. Duffy! (holotype & paratypes).

Description. Shell large (holotype 27.2 mm maximum length, including peristome, decollate x 19.0 mm maximum width, including peristome), ovate, umbilicus narrow but open, may be decollate as adult, polished. Nuclear whorls 1 ½, smooth, but often lost. Teleoconch of 4 – 5 ½ whorls, adnate. Suture indented. Peristome double (holotype 10.4 mm diameter maximum inner aperture height x 7.9 mm diameter maximum inner aperture width; holotype 13.6 mm diameter maximum outer peristome height x 11.3 mm diameter maximum outer peristome width, but broken). Outer lip moderately expanded, undulating, narrowest over umbilicus, minimally adherent to the previous whorl, produced into a weak auricle posteriorly, separate from the previous whorl. Inner lip adherent to outer lip or barely exserted. Spiral sculpture limited to weak cords in the umbilicus. Axial sculpture of closely spaced, very low, undulating ribs. Background white with axial brown and tan markings broken up by spiral, colorless zones. Base spotted. Pattern extends to both sides of the outer lip. Operculum paucispiral chondroid plate on which are calcareous lamellae divided into two regions: outer half of the spiral with very coarse lamellae, inner half smoothly fused. The outer edges of the opercular spiral are raised, not flush with the previous whorls.

Discussion. Species of *Chondropomella* Bartsch, 1932, are among the largest of annulariids. They are rarely seen in collections. Bartsch included two species in his genus: *C. magnifica* Pfeiffer, 1852, and *C. platychila* Pfeiffer, 1848. Watters (2006) included a third species, *Incertipoma virile* Bartsch, 1946.
The distribution of the three species has been the subject of speculation. Pfeiffer recorded "*insula Haiti*" for the type locality of *C. magnifica*, collected by the French explorer August Sallé. Crosse (1890) stated that Sallé had found the species on rocks at the entrance to a cave at Barrera, which Bartsch (1946) further localized in Azua Province about 27 km southwest of Azua. The specimen illustrated here (Fig. 31) is from Barrera.
Pfeiffer originally (1847b) misidentified the worn specimen he would later name *C. platychilum* as *Cyclostoma latilabris* d'Orbigny, 1842, a Cuban species. In 1848 he renamed the specimen *C. platychilum* but was unaware of its origin. Bartsch (1946) identified a specimen at the U.S. National Museum (also worn) from Trujin as an example of Pfeiffer's *C. platychilum*. As for *Incertipoma virile* Bartsch gave only "Haiti" as the type locality.
No specimen before Bartsch of these three species had an operculum. But Pfeiffer (1852), in his original description of *C. magnificum*, observed "*Operc. Cartilagineum, planum, pallide corneum*" suggesting, as Bartsch noted, a chondropomine operculum. (The type has not been located and is presumed lost.) Because of this both Bartsch (1946) and Watters (2006) placed *Chondropomella* in the Chondropominae. However, these species also seem closely related to the tudorine *Chondropomium* in

terms of size, sculpture, and geography. Watters (2006) noted that some populations of *Chondropomium superbum* (Henderson & Simpson, 1902) have pseudolamellate opercula whereas others do not. The fact that *C. elegans* has a pseudolamella places it near *Chondropomium*. But its obvious affinities with *C. magnificum* suggest that both should be included near *Chondropomella*. The relevant points are: the opercula of *C. platychilum* and *C. virilis* are unknown; the operculum of *C. magnificum* apparently lacks a pseudolamella (based on a single observation); and the operculum of *C. elegans* possesses a pseudolamella. Apparently *Chondropomella*, like *Chondropomium*, may or may not have a pseudolamella. Because of this *Chondropomella* is herein removed from the Chondropominae and placed in the Tudorinae near *Chondropomium*.

Chondropomella was based on species with a sinuous, widely expanded outer lip adherent to the previous whorl. The inclusion of *C. elegans* requires a reworking of that definition and the recognition of additional species for inclusion in *Chondropomella*. *Chondropomella* differs from the closely related *Chondropomium* in having a widely expanded outer lip that may or may not be adherent to the earlier whorl; *Chondropomium* species have virtually no expansion to this lip. Otherwise both genera have similar sculpture and attain a similar large size. The following two species are removed from *Chondropomium* to *Chondropomella*: *Chondropoma asymmetricum* Pilsbry, 1933, from Fond Parisien on the south shore of Étang Saumâtre in Haiti, originally described in *Chondropoma* (*Chondropomella*) by Pilsbry but removed from *Chondropomella* by Watters (2006), but herein reinstated; and *Chondropoma inaequilabrum* Bartsch, 1946, from Mount Petitchemin on the Tiburon Peninsula of Haiti. *Chondropomella* thus contains six species: *C. magnificum, C. platychilum, C. virile, C. elegans, C. asymmetricum*, and *C. inaequilabrum*. *Chondropomella* occupies the valley between Sierra de Bohoruco and Neiba Sierra, including the lake region, spanning the Haiti-Dominican Republic border.

Chondropomella elegans is very similar to *C. magnificum* but differs in sculpture. The axial sculpture of *C. elegans* consists of very low undulating ribs; in some places the surface is completely smooth. The suture is not modified by the axial ribs. In *C. magnificum* the axial sculpture is of minute, narrow, widely separated threads that form minute cusps at the suture. The color patterns of the two species are nearly identical. The two species are separated by ~100 km.

Etymology. Latin *elegans*, elegant, in reference to the impressive color pattern and size of the shell.

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